

CLAIMS:

- 1 A monoclonal antibody or a fragment thereof capable of specifically binding to native and denatured normal (PrP^C) and disease-specific prion protein (PrP^{Sc}) in an antigen-antibody complex
- 5 2 A monoclonal antibody according to claim 1 which is only capable of binding to native disease-specific prion protein and not to native normal prion protein
- 3 A monoclonal antibody according to claim 1 wherein the prion protein is soluble
- 4 A monoclonal antibody according to claim 1 wherein the prion protein is insoluble.
- 10 5 A monoclonal antibody according to claim 1 wherein the prion protein is a recombinant prion protein.
- 6 A monoclonal antibody according to claim 1 wherein the prion protein is reduced.
- 7 A monoclonal antibody according to claim 1 wherein the prion protein is oxidized.
- 15 8 A monoclonal antibody according to claim 1 which is named 6H4
- 9 A monoclonal antibody according to claim 1 which is named 34C9
- 10 A monoclonal antibody according to claim 1 and 2 which is named 15B3.
- 11 A monoclonal antibody according to claim 1 which comprises an epitope binding fragment of anyone of the monoclonal antibodies 6H4 or 34C9 or 15B3.
- 20 12 A monoclonal according to claim 1 or 2 coupled to other molecules especially fragments of other antibodies, enzymes or organic chemical compounds.
- 13 An antibody raised against the binding region (idiotype) of the antibodies according to claim 1 or 2.
- 14 A hybridoma cell line capable of producing a monoclonal antibody according to
- 25 anyone of claims 1-13.
- 15 A hybridoma cell line according to claim 14 deposited under DSM.ACC2295 cabable of producing the monoclonal antibody 6H4.
- 16 A hybridoma cell line according to claim 14 deposited under DSM ACC2296 cabable of producing the monoclonal antibody 34C9.
- 30 17 A hybridoma cell line according to claim 14 deposited under DSM ACC2298 cabable of producing the monoclonal antibody 15B3.

18. A recombinant protein derived from cloning protein-coding sequences from cell lines according to claims 15, 16, 17

19. A recombinant protein according to claim 18 where the protein is expressed in a phage display system or any other system and affinity matured.

5 20. A recombinant expression vector for the expression of the bovine prion protein

21. A recombinant expression vector according to claim 20 which is named pbPrP3.

22. The purified recombinant bovine prion protein in reduced or oxidized form or in form of a mixture thereof.

10 23. A recombinant protein according to claim 22, where the purified recombinant prion protein is from any species.

24. A method for the production of an antibody according to claim 1, comprising culturing a hybridoma cell line according to claim 14 and isolating the monoclonal antibody from the supernatant.

25. A method for the production of a hybridoma cell line according to claim 14,
15 comprising administering to PrP^{0/0} mice (knockout mice without a functional PrP gene) an immunizing amount of a prion protein according to claim 22 or 23, removing the spleen from the immunized mice, recovering splenocytes therefrom, fusing the latter with a myeloma cell line, growing the fused cells in a selection medium, screening the antibodies in the supernatants of hybridoma cells for binding to native disease-specific and recombinant
20 Pr P and isolating the hybridoma cells producing monoclonal antibodies according to claim 1.

26. A method for the production of antibodies according to claims 1 or 2 comprising administering an immunizing amount of a prion protein according to claim 22 or 23 to PrP^{0/0} mice.

25 27. A method for the production of a hybridoma cell line according to claim 26 where the immunized species is a wild-type mouse, a transgenic mouse or any other wild-type or transgenic species.

28. A method for the production of an expression vector according to claim 20, comprising inserting a DNA coding for the bovine PrP in the correct reading frame into an
30 expression vector.

29. A method for the production of a purified bovine PrP protein comprising culturing a microorganism or eukaryotic cell line with an expression vector according to claim 20 in an appropriate culture medium and isolating and purifying the protein.

30. A test kit for the diagnosis of prion diseases comprising one or more
5 monoclonal antibodies according to claim 1, purified recombinant bovine PrP protein according to claim 23, nitrocellulose sheets, microtiter plates coated or covalently linked with monoclonal antibodies according to claim 1, an antibody that is coupled with an enzyme and its substrate for a detection reaction, proteinase K, blocking buffer, homogenisation buffer and a detailed description of how to perform the test.

10 31. A test kit according to claim 30 comprising a nitrocellulose membrane in the dipstick format coated with an antibody according to claim 1 or 2, a dilution buffer, a solution containing an antibody according to claim 1 or 2, coupled to colloids evoking a colouring reaction when present in an antigen-antibody complex, and a detailed description of how to perform the test.

15 32. An immunological detection procedure for the detection of disease-specific PrP in biological material of an animal or human comprising treatment of a probe of said material with proteinase K and then with the monoclonal antibody according to claim 1 or 2, detecting the prion protein-antibody complex and analysing the results.

20 33. An immunological detection procedure according to claim 32 comprising treatment of a probe of said material with the monoclonal antibody according to claim 2 without prior treatment with proteinase K, detecting the prion protein-antibody complex and analysing the results.

34. A method according to claims 30 to 32 where instead of using a monoclonal antibody recombinant prion protein according to claims 22 and 23.

25 35. A pharmaceutical preparation for the therapy and prevention of prion diseases comprising a monoclonal antibody or fragments thereof according to claim 1 or 2 and a pharmaceutical carrier.

30 36. A method for the therapy or prevention of prion diseases comprising administering to a patient suffering from such disease or being likely to becoming a victim of this disease a therapeutical or preventive amount of a monoclonal antibody according to claim 1 or 2.

37. A method for clearing biological material from prions comprising treating said material with a monoclonal antibody according to claim 1 or 2.

38. A method for the therapy or prevention of prion diseases, or the vaccination against prion diseases comprising administering to a patient or an animal suffering from such a disease or being likely to becoming a victim of this disease a therapeutical or preventive amount of recombinant PrP or fragments thereof according to claim 22 or 23

5 39. Use of a monoclonal antibody according to claims 1 or 2 or recombinant PrP or fragments thereof according to claim 22 or 23 for the production of a medicine or a vaccine for the therapy or prevention of prion diseases, or the vaccination against prion diseases

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